

In the Claims

1. (Cancelled)

2. (Currently Amended) An image decoding apparatus comprising:

first to N-th MPEG decoding devices for converting input first to N-th image coded data for generating and outputting first to N-th image data by decoding said first to N-th image coded data;

an external memory device for storing decoded data of said first to N-th image data generated by respective decoded devices and for storing filter parameters used for converting the image data into respective image formats;

first to N-th image format conversion devices for generating and outputting first to N-th image data by converting any of said image data from among said first to N-th image data read from the external memory device into respective predetermined image formats determined by the filter parameters; and

first to N-th image synchronization signal generating and synchronization adjusting devices for generating horizontal and vertical image synchronized signals, which are output together with said first to N-th image data converted respective predetermined image formats,

wherein first to N-th vertical synchronized signals are generated synchronously in the same phase;

wherein said filter parameters are output from the external memory portion to respective first to N-th image format conversion devices while no decoded data is output from the external memory device.

3. (Previously Amended) An image decoding apparatus according to claim 2, wherein the image decoding apparatus comprises a distribution control apparatus for distributing any of the image data among first to N-th image data respectively to first to N-th image format conversion devices, in response to a request of said first to N-th image format conversion device.

4. (Previously Amended) An image decoding apparatus according to claim 2, wherein at least one of said first to N-th image coded data is input through a PCI (Peripheral Component Interconnect) bus.

5. (Currently Amended) An image decoding apparatus ~~according to claim 1,~~
~~wherein the image decoding apparatus comprising:~~

first to N-th MPEG decoding devices which decode input first to N-th coded data for outputting decoded first to N-th data to an external memory;

an external memory for storing decoded first to N-th image data and filter parameters used for converting decoded image data into respective image formats;

first to N-th image format conversion devices for generating and outputting first to N-th decoded image data from said first to N-th image data into respective predetermined format;

wherein the image decoding apparatus comprises:

an image synchronizing signal generation device for generating and outputting a first vertical image synchronizing signal used for outputting said image by any one of the image format conversion devices among said first to N-th image format conversion devices; and

first to M-th (M: an integer equal to N-1) image synchronizing signal generating and synchronization adjusting devices for generating and outputting the second to the N-th vertical image synchronizing signals respectively in synchronization with said first vertical image synchronizing signal by said image format conversion devices other than said one of the image format conversion device.

6. (Currently Amended) An image decoding apparatus according to claim 5 wherein said first to M-th image synchronizing signal generating and synchronization adjusting devices comprise:

a counter for generating any one of said second to N-th vertical image synchronizing signals generated and output respectively by said first to M-th image synchronizing signal generating and synchronization adjusting devices; and

a counter control device for controlling the operation of said counter based on said first vertical image synchronizing signal.

7. (Currently Amended) An image decoding device according to ~~claim 1~~ claim 2, wherein at least one of said image format conversion devices among said first to N-th image format conversion devices generates an image converted into a format composed of 1920 pixels in the horizontal direction and 1080 lines in the vertical direction, and at least one of said image format conversion devices generates an image converted into a format composed of 720 pixels in the horizontal direction and 480 lines in the vertical direction.

8. (Previously Amended) An image decoding apparatus according to claim 2, wherein at least one of said decoding device and said first to N-th image format conversion devices are formed on the same semiconductor integrated circuit substrate.

9. (Currently Amended) A semiconductor device comprising:
a decoding device for generating an image data by decoding input image coded data, and for storing the thus generated image data in an externally installed memory device;
a decoded data reading device for reading said image data stored in said memory device in response to an inputting decoded data request signal and for outputting as the decoded data and filter parameters stored in the memory device are used for converting the image data into an image format;

an image synchronizing signal generation device for generating and outputting a first horizontal image synchronizing signal and a first vertical image synchronizing signal;

an image synchronizing signal generating and synchronization adjusting device for generating and outputting a second horizontal image synchronizing signal and a second vertical image synchronizing signal, which is synchronized with said first vertical image synchronizing signal;

a first image format conversion device for generating a first image by converting said input decoded data signal into a predetermined image format, and for outputting said first image after synchronizing with said first horizontal image synchronizing signal and said first vertical image synchronizing signal; and

a second image format conversion device for generating a second image by converting said inputting decoded data signal into a predetermined image format, and for outputting said

second image after synchronizing with said second horizontal image synchronizing signal and said second vertical image synchronizing signal,

wherein said first and second vertical synchronization signals are generated synchronously in the same phase, and said first and second filter parameters are output from the external memory device while no decoded data is output from the external memory device to be multiplexed with said first and second synchronizing signals for outputting to respective first to second image format conversion devices.

10. (Currently Amended) A semiconductor device comprising:

a first decoding device for generating a first image data by decoding input first image coded data and for storing the generated first image data in an externally installed memory device;

a second decoding device for generating a second image data by decoding an input second image coded data, and for storing the generated second image data in an externally installed memory device;

a decoded data reading device for reading said first or second image data stored in said memory device in response to an inputting first decoded data request signal and for reading said first or second image data stored in said memory device in response to an ~~inputting~~ second decoded data request signal and for outputting multiplexed decoded data prepared by multiplexing said first or second image data;

a distribution control device for distributing said multiplexed decoded signal ~~to as~~ a first decoded data signal corresponding to said first decoded data request signal and a second decoded data signal corresponding to said second decoded data request signal;

an image synchronizing signal generation device for generating a first horizontal image synchronizing signal and a first vertical image synchronizing signal;

an image synchronizing signal generating and synchronization adjusting device for generating and outputting a second horizontal image synchronizing signal and a second vertical image synchronizing signal;

a first image format conversion device, which outputs a ~~first~~ the first decoded data request signal for generating a first image by converting said ~~input first~~ first decoded data signal into a first predetermined image format and for outputting said first image after synchronizing

with said first horizontal image synchronizing signal and said first vertical image synchronizing signal; and

a second image format conversion device which outputs ~~a second~~ the second decoded data request signal for generating a second image by converting said inputting decoded data signal into a second predetermined image format, and for outputting said second image after synchronizing with said second horizontal image synchronizing signal and said second vertical image synchronizing signal,

wherein said first and second synchronization signals are synchronized with each other, and first and second filter parameters are output from the external memory portion to be multiplexed with said first and second synchronization signals respectively while no decoded data is output from the external memory device and the multiplexed data are output to respective first to second image format conversion devices.

11. (Previously Amended) A semiconductor device according to claim 10, wherein at least said decoding device, said image synchronizing signal generating device, said image synchronizing signal generating and synchronization adjusting device, said image format conversion device, and said second image format conversion device are formed on a semiconductor integrated circuit substrate.

12. (Currently Amended) An image decoding method for decoding an inputting image coded data and for generating an image data comprising the steps of:

generating a first horizontal image synchronizing signal and a first vertical image synchronizing signal;

generating a second horizontal image synchronizing signal and a second vertical image synchronizing signal which is synchronized with said first vertical image synchronizing signal;

generating a first image by converting said image data into a predetermined image format and outputting the generated first image after synchronizing said first image with said first horizontal image synchronizing signal and with said first vertical image synchronizing signal; and

generating a second image by converting said image data into a predetermined image format and outputting the generated second image after synchronizing said second image with said second horizontal image synchronizing signal and with said second vertical image synchronizing signal,

synchronizing said first and second synchronization signals to each other;

outputting first and second filter parameters from the external memory portion while no decoded data is output from the external memory device, to be multiplexed with said first and second synchronization signals respectively and the multiplexed data are output to respective first to second image format conversion devices.

13. (Currently Amended) An image decoding method comprising:

generating a first image data by decoding an inputting first image coded data;

generating a second image data by decoding an inputting second image coded data;

controlling the distribution of said first and second image data to their request sources;

generating a first horizontal image synchronizing signal and a first vertical image synchronizing signal;

generating a second horizontal image synchronizing signal and a second vertical image synchronizing signal synchronized with said first vertical image synchronizing signal;

generating a first image from said requested first image data by converting into a predetermined image format and outputting said first image after synchronizing said first image with said first horizontal image synchronizing signal and said first vertical image synchronizing signal; and

generating a second image from said requested second image data by converting into a predetermined image format and outputting said second image after synchronizing said second image with said second horizontal image synchronizing signal and said second vertical image synchronizing signal;

synchronizing said first and second synchronization signals with each other;

outputting first and second filter parameters from the external memory portion while no decoded data is output from the external memory device, to be multiplexed with said first and second synchronization signals respectively, and the multiplexed data are output to respective first to second image format conversion devices.

14. (New) An image decoding apparatus according to claim 2, further comprising a decoded data reading portion for reading decoded data and filter parameters for converting image data into respective image formats from the external memory device and for distributing the decoded data to first to N-th image format converting portions, wherein the decoded data and filter parameters to be distributed to respective image format converting devices are multiplexed.